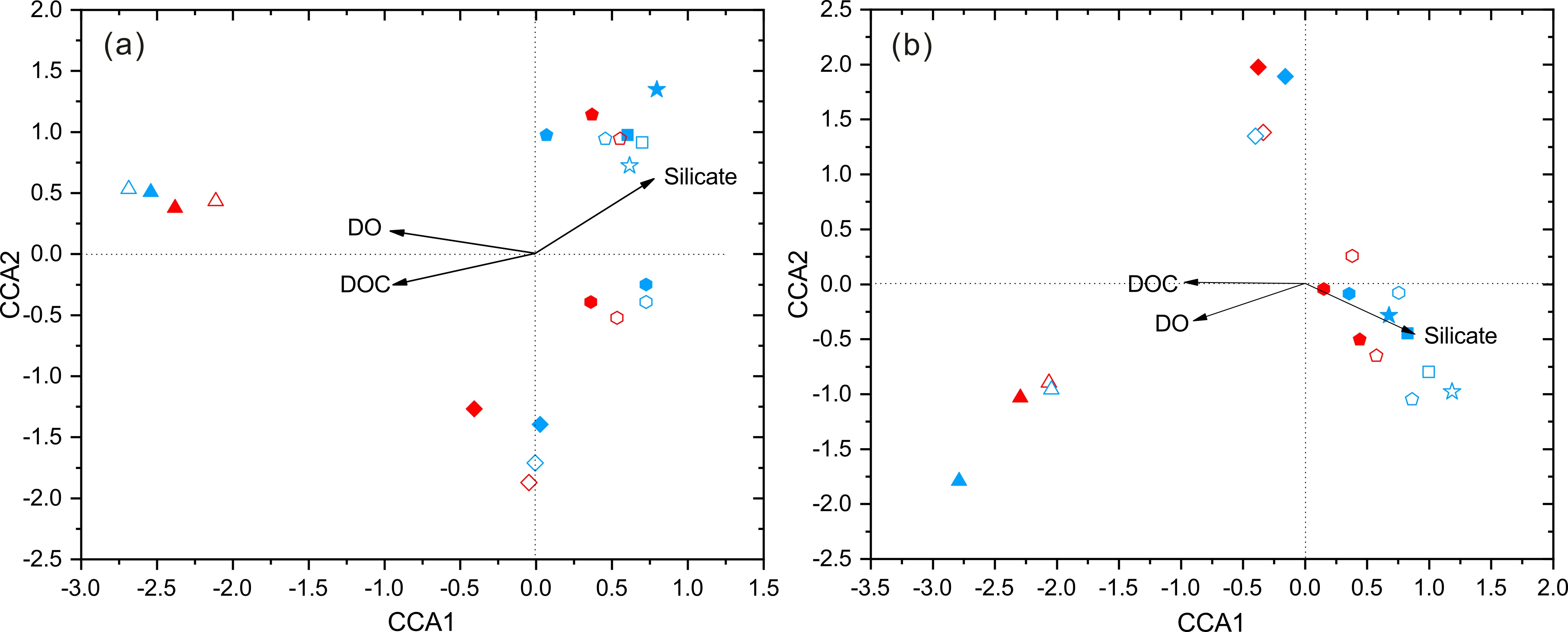


**Figure S1**. Bathymetric map of the South China Sea and sampling locations (+) of two water columns (G3 and J5 stations) in this study.

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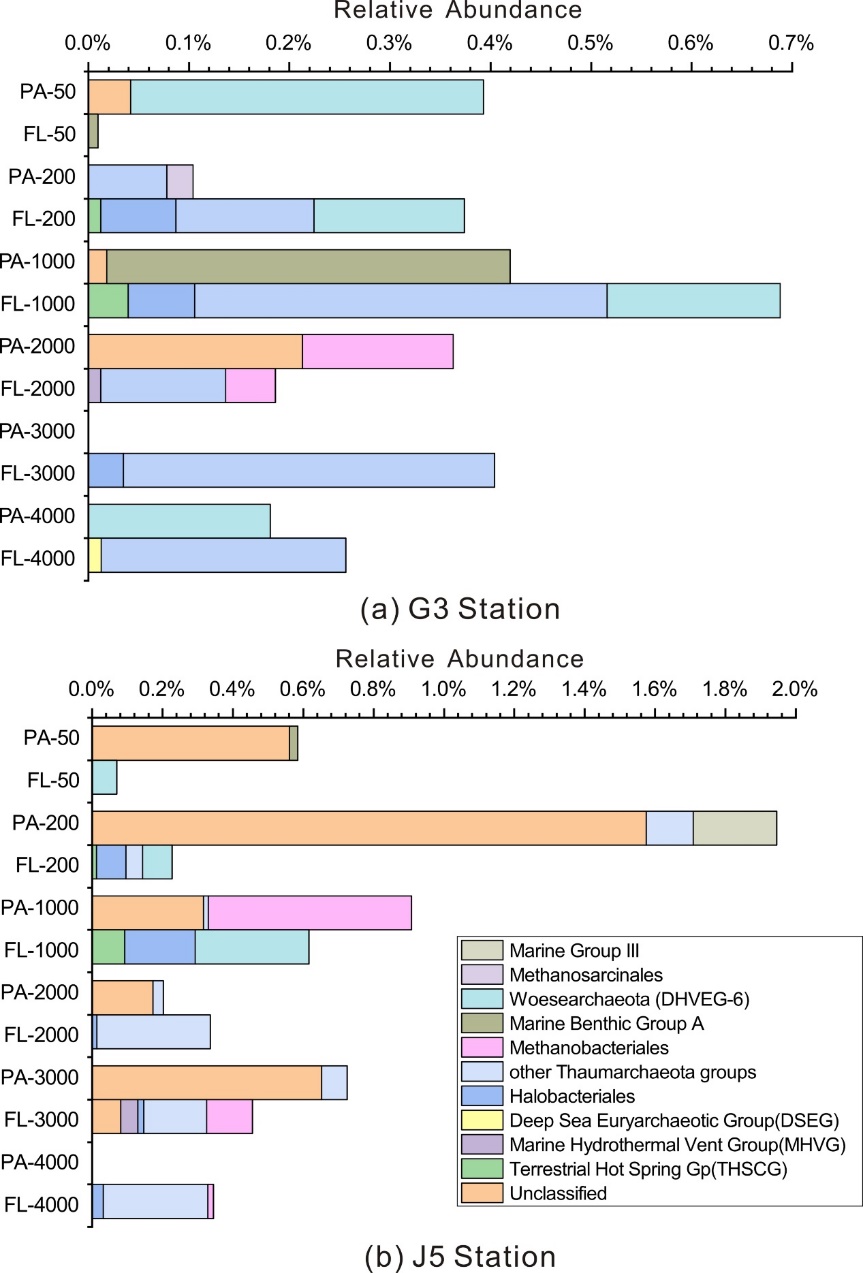
**Figure S2.** Chao1 index calculated for all bacterial and archaeal communities of seawaters collected at different depths from G3 station and J5 station in the South China Sea.



**Figure S3.** Results of CCAanalysis to correlated several environmental factors including DOC, DO and silicate concentration to PA and FL microbial communities collected from seawater columns of the South China Sea. (a) PA and FL bacteria; (b) PA and FL archaea. Triangle: 50 m; rhombus: 200 m; hexagon: 1000 m; star: 2000 m; square: 3000 m; pentagon: 4000 m. Blue color: J5 station; red color: G3 station. Filled: particle-attached fraction; open: free-living fraction.

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**Figure S4.** Taxonomic compositions of bacterial “others” groups comprised of the phylum or class with less than 1% proportions in seawater bacterial communities of two fractions. (a) G3 station; (b) J5 station.



**Figure S5.** Taxonomic compositions of archaeal “others” groups comprised of the phylum or class with less than 1% proportions in seawater archaeal communities of two fractions. (a) G3 station; (b) J5 station.